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Algebraic Number Theory and Related Topics 2009

edited by Takashi Ichikawa, Masanari Kida and Takao Yamazaki

April, 2011

**Research Institute for Mathematical Sciences
Kyoto University**

RIMS Kôkyûroku Bessatsu B25

Algebraic Number Theory
and
Related Topics 2009

December 7 ~11, 2009

edited by Takashi Ichikawa, Masanari Kida and Takao Yamazaki

April, 2011

Research Institute for Mathematical Sciences

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PREFACE

This volume of *Kôkyûroku Bessatsu* is a collection of research articles, research announcements and survey articles which were contributed by invited speakers in the workshop “Algebraic Number Theory and Related Topics” supported by the Research Institute for Mathematical Sciences of the Kyoto University (RIMS). This was held at the Graduate School of Mathematical Science of the University of Tokyo from December 7 through December 11, 2009.

The aim of this conference was to overview recent developments in algebraic number theory in the broadest sense that ranges from arithmetic algebraic geometry to number theory involving analytic arithmetic functions or representation theory of algebraic groups. There were 22 lectures given at the workshop and 178 participants during the conference. These lectures include special talks in commemoration of Takagi 50th anniversary given in the afternoon session on December 9.

It is our great pleasure that this volume collects 12 contributions from the speakers. All papers here are refereed and are in final form. Furthermore, for the convenience of reading and referring, the contributions are classified in the three categories:

- Research Articles
- Research Announcements
- Survey Articles

following the views of the authors.

The workshop was organized by Takeshi SAITO, Masanari KIDA, Takao YAMAZAKI and myself, and the last three members also acted as the editors of this volume.

We would like to express our sincere gratitude to all participants, the invited speakers and the anonymous referees of articles of this volume, who have made the symposium successful and scientifically rich. Finally, our special thanks go to the staffs of RIMS and University of Tokyo for their support, especially to Professor Akio TAMAGAWA for many pieces of helpful advice to our organization of the symposium.

Chief Editor
Takashi ICHIKAWA

PROGRAM

Algebraic Number Theory and Related Topics

Date: December 7–11, 2009

Place: The Main Auditorium

The Graduate School of Mathematical Science, The University of Tokyo

Organizers: Takashi Ichikawa (Saga University)

Takeshi Saito (The University of Tokyo)

Masanari Kida (UEC)

December 7, Monday

12:50 – 13:00 Introduction

13:00 – 14:00 Kenichi Bannai (Keio University)
Eisenstein classes and Katz’s p -adic L -function (joint with G. Kings)

14:15 – 15:15 Dong-Uk Lee (Korean Institute for Advanced Study)
Local monodromy of formal groups and the ordinary Hecke orbit conjecture for some unitary Shimura varieties

15:30 – 16:30 Manabu Yoshida (Kyushu University)
Ramification of local fields and Fontaine’s property (P_m)

16:45 – 17:45 Yoichi Mieda (Kyushu University)
Nearby cycle functor for adic spaces

December 8, Tuesday

10:00 – 11:15 Shu Kawaguchi (Osaka University)
Introduction to algebraic and arithmetic dynamics – a survey

11:30 – 12:30 Yu Yasufuku (City University of New York, Graduate Center)
Vojta’s Conjecture and Dynamics

- 14:00 – 15:00 Shun Ohkubo (University of Tokyo)
A note on Sen’s theory in the imperfect residue field case
- 15:15 – 16:15 Kentaro Nakamura (Keio University)
Zariski density of two dimensional cristalline representations
- 16:30 – 17:30 Yoshiyasu Ozeki (Kyushu University)
Non-existence of certain Galois representations with a uniform tame inertia weight

December 9, Wednesday

- 10:00 – 11:00 Fabien Trihan (University of Nottingham)
The p -parity conjecture over function fields of characteristic $p > 0$
- 11:15 – 12:15 Yasushi Komori (Nagoya University)
Functional equations for Weng’s zeta functions for (G, P)

Academic lectures in commemoration of Takagi 50th anniversary

(Jointly organized with The Mathematical Society of Japan and
The Graduate School of Mathematical Science, University of Tokyo)

- 14:00 – 14:10 Greeting
- 14:15 – 15:30 Shuji Saito (University of Tokyo)
Higher higher class field theory
- 15:45 – 16:00 DVD
A Japanese mathematician of modern times with worldwide achievement – Teiji Takagi
- 16:15 – 17:30 Katsuya Miyake (Waseda University)
Takagi’s class field theory – From where? and to where? –

December 10, Thursday

- 10:00 – 11:15 Takashi Taniguchi (Kobe University)
Survey on “Higher composition laws”
- 11:30 – 12:30 Yuji Tsuno (Chuo University)
Normal basis problem for torsors under a finite flat group scheme

- 14:00 – 15:00 Takayuki Morisawa (Waseda University)
Weber's Problem in the Cyclotomic \mathbb{Z}_3 -extension of \mathbb{Q}
- 15:15 – 16:15 Satoshi Fujii (Keio University)
Generalized Greenberg's conjecture and unramified Galois groups over the cyclotomic \mathbb{Z}_p -extensions
- 16:30 – 17:30 Takashi Miura (Keio University)
The class groups for CM-fields and Stickelberger ideals

December 11, Friday

- 10:00 – 11:15 Katsuyuki Takashima (Mitsubishi Electric)
A Survey of Cryptosystems using Pairings on Elliptic Curves
- 11:30 – 12:30 Kazuo Matsuno (Tsuda College)
Computation of 2-adic Iwasawa invariants of elliptic curves and Main Conjecture
- 14:00 – 15:00 Francesco Lemma (Osaka University)
A norm compatible system of Galois cohomology classes for $GSp(4)$
- 15:15 – 16:15 Tomokazu Kashio (Kyoto University)
On the relation between p -adic multiple gamma functions and p -adic periods

Program committee members: Takashi Ichikawa, Masanari Kida,
Takao Yamazaki (Tohoku University)

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